UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,855	03/12/2004	Hisashi Amaya	12054-0024	6672

22902 7590 06/27/2011

CLARK & BRODY
1700 Diagonal Road, Suite 510
Alexandria, VA 22314

EXAMINER	
ROE, JESSEE RANDALL	
ART UNIT	PAPER NUMBER
1733	
MAIL DATE	DELIVERY MODE
06/27/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,855	AMAYA ET AL.	
	Examiner	Art Unit	
	JESSEE ROE	1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8 and 13-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 13-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24 May 2011 has been entered.

Status of the Claims

Claims 1-8 and 13-20 are pending wherein claims 1-8 and 13-20 are amended and claims 9-12 are canceled.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8 and 13-20 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to the added recitation "a yield strength of the steel after cooling by quenching or air cooling in a final treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa" in claims 1-8 and 13-20, the Examiner notes that Table 2 discloses steel alloys that have a yield strength below 815 MPa and thus there is not support for the recitation "a yield strength of the steel after cooling by quenching or air cooling in a final treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa".

Claims 1-8 and 13-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for yield strengths of 834 MPa, 899 MPa, 905 MPa, 932 MPa, 904 MPa, 886 MPa, 960 MPa, 860 MPa, 862 MPa, 660 MPa, 884 MPa, 817 MPa, 815 MPa, 813 MPa, 908 MPa, 855 MPa, and 953 MPa (Table 2), does not reasonably provide enablement for the entire scope associated with "a yield strength of 815 MPa or more" or "a yield strength of the steel after cooling by quenching or air cooling in a fina treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa" such as yield strengths of 1000 MPa, 1100 MPa, 1200 MPa or 10000 MPa. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to provide yield strengths commensurate in scope with these claims.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 and 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to the recitation "A martensitic stainless steel having a yield strength of 815 MPa or more" and the recitation "a yield strength of the steel after cooling by quenching or air cooling in a final heat treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa", the Applicant primarily argues (page 16 of the Remarks) that the martensitic stainless of the present invention has (1) a yield strength of the final product [yield strength A] of 815 MPa or more, and (2) a yield strength [yield strength B] of the steel after cooling by quenching or air cooling in a final treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa and "yield strength" does not necessarily equal "yield strength A". If yield strength A does not equal yield strength B, then the claims are drawn to steel at two different points in the process (i.e., a final steel product and an intermediate steel product). Therefore the scope of the claims are indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-8 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oka et al. (JP 11-310823).

In regards to claims 7-8, Oka et al. (JP '823) discloses a martensitic stainless steel having a composition relative to that of the instant invention as shown below (abstract and [0005]).

Element	**Instant Claims** (weight percent)	**Oka et al. (JP '823)** (weight percent)	**Overlap**
C	0.02 – 0.10	0.10 – 0.18	0.10
Si	0.05 – 1.0	0 – 0.5	0.05 – 0.5
Mn	0.05 – 0.95	0.1 – 1.5	0.1 – 0.95
P	0 – 0.03	0 – 0.02	0 – 0.02
S	0 – 0.01	0 – 0.01	0 – 0.01
Cr	9 – 15	12 – 14	12 – 14
Ni	1.0 – 4.5	1 – 3	1 – 3
Al	0 – 0.05	0 – 0.30	0 – 0.05
N	0 – 0.1	0.001 – 0.08	0.001 – 0.08
Cu	0.05 – 5	0 – 1.5	0.05 – 1.5
Mo	0.05 – 5	0 – 0.5	0.05 – 0.5
Ti	0.005 – 0.5	0.001 – 0.05	0.005 – 0.05
Ca	0.0003 – 0.005	0.001 – 0.01	0.001 – 0.005
Fe	Balance	Balance	Balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, titanium and calcium of the martensitic stainless steel alloy disclosed by Oka et al. (JP '823) overlaps the composition of the instant invention, which is *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions disclosed by Oka et al. (JP '823) because Oka et al. (JP '823) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the hardness range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume %." in claims 7-8, the Examiner notes that Oka et al. (JP '823) discloses a substantially similar composition in addition to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point. Therefore, a hardness in the range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume % would be expected due to a substantially similar composition and process. MPEP 2112.01 I.

With respect to the formula $0.2\% \leq Mo + Cu/4 \leq 5\%$ in claim 7 and $0.55\% \leq Mo + Cu/4 \leq 5\%$ in claim 8, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Oka et al. (JP '823) such that the formula would be satisfied because Oka et al. (JP '823) discloses the same utility throughout the disclosed ranges.

With respect to the presence of impurities in line 7 of claims 7-8, Oka et al. (JP '823) discloses the presence of impurities (abstract).

With respect to the added recitation "a yield strength of the steel after cooling

by quenching or air cooling in a final heat treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa" , Oka et al. (JP '823) teaches heating up to a temperature between Ac_1 and the Ac_3 point and then tempering at a temperature not higher than the Ac_1 point (abstract and [0007-0008]) and a yield s strength that exceeds 650 MPa [0026]. Therefore, Oka et al. (JP '823) meets the claim.

In regards to claims 19-20, Oka et al. (JP '823) discloses a martensitic stainless steel having a composition relative to that of the instant invention as shown below (abstract and [0005]).

Element	**Instant Claims** (weight percent)	**Oka et al. (JP '823)** (weight percent)	**Overlap**
C	0.02 – 0.10	0.10 – 0.18	0.10
Si	0.05 – 1.0	0 – 0.5	0.05 – 0.5
Mn	0.05 – 0.95	0.1 – 1.5	0.1 – 0.95
P	0 – 0.03	0 – 0.02	0 – 0.02
S	0 – 0.01	0 – 0.01	0 – 0.01
Cr	9 – 15	12 – 14	12 – 14
Ni	1.0 – 4.5	1 – 3	1 – 3
Al	0 – 0.05	0 – 0.30	0 – 0.05
N	0 – 0.1	0.001 – 0.08	0.001 – 0.08
Cu	0.05 – 5	0 – 1.5	0.05 – 1.5
Mo	0.05 – 5	0 – 0.5	0.05 – 0.5
Ti	0.005 – 0.5	0.001 – 0.05	0.005 – 0.05
Ca	0.0003 – 0.005	0.001 – 0.01	0.001 – 0.005
Fe	Balance	Balance	Balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, titanium and calcium of the martensitic stainless steel alloy disclosed by Oka et al. (JP '823) overlaps the composition of the instant invention, which is *prima facie* evidence of

obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions disclosed by Oka et al. (JP '823) because Oka et al. (JP '823) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the hardness range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume %." in claims 19-20, the Examiner notes that Oka et al. (JP '823) discloses a substantially similar composition in addition to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point. Therefore, a hardness in the range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume % would be expected due to a substantially similar composition and process. MPEP 2112.01 I.

With respect to the formula $0.2\% \leq Mo + Cu/4 \leq 5\%$ in claim 19 and $0.55\% \leq Mo + Cu/4 \leq 5\%$ in claim 20, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Oka et al. ('520) such that the formula would be satisfied because Oka et

al. (JP '823)discloses the same utility throughout the disclosed ranges.

With respect to the presence of impurities in line 7 of claims 19-20, Oka et al. (JP '823) discloses the presence of presence of impurities (abstract).

With respect to the recitation "the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400℃ or lower tempering treatment, or air cooling followed by a 400°C or lower tempering treatment" in claims 19-20 et al. (JP '823) discloses to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point.. Therefore, the same or a substantially similar structure would be expected.

With respect to the recitation "and the amounts of Cu and Mo effective to form a sulfide layer on a formed chromium oxide layer" in claims 19-20, the Examiner asserts that Oka et al. (JP '823) discloses amounts of copper and molybdenum effective to form this sulfide layer because Oka et al. (JP '823) discloses a substantially similar composition. MPEP 2112.01 I.

With respect to the recitation "the sulfide layer formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment" in claims 19-20, Oka et al. (JP '823) discloses a substantially similar composition. Therefore, formation of the sulfide layer would be expected when subjecting the alloy to a sulfur-containing environment. MPEP 2112.01 I.

With respect to the added recitation "a yield strength of the steel after cooling by quenching or air cooling in a final heat treatment after final heating at a temperature

of the Ac_3 point or more is not less than 815 MPa" in claims 19-20, Oka et al. (JP '823) teaches heating up to a temperature between Ac_1 and the Ac_3 point and then tempering at a temperature not higher than the Ac_1 point (abstract and [0007-0008]) and a yield strength that exceeds 650 MPa [0026]. Therefore, Oka et al. (JP '823) meets the claim.

In regards to claims 5-6, Oka et al. (JP '823) discloses a martensitic stainless steel having a composition relative to that of the instant invention as shown in the table below (abstract and [0005]).

Element	**Instant Claims** (weight percent)	**Oka et al. (JP '823)** (weight percent)	**Overlap**
C	0.02 – 0.10	0.10 – 0.18	0.10
Si	0.05 – 1.0	0 – 0.5	0.05 – 0.5
Mn	0.05 – 0.95	0.1 – 1.5	0.1 – 0.95
P	0 – 0.03	0 – 0.02	0 – 0.02
S	0 – 0.01	0 – 0.01	0 – 0.01
Cr	9 – 15	12 – 14	12 – 14
Ni	1.0 – 4.5	1 – 3	1 – 3
Al	0 – 0.05	0 – 0.30	0 – 0.05
N	0 – 0.1	0.001 – 0.08	0.001 – 0.08
Cu	0.05 – 5	0 – 1.5	0.05 – 1.5
Mo	0.05 – 5	0 – 0.5	0.05 – 0.5
Ti	-	0.001 – 0.05	-
Ca	0.0003 – 0.005	0.001 – 0.01	0.001 – 0.005
Fe	Balance	Balance	Balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, and calcium of the martensitic stainless steel alloy disclosed by Oka et al. (JP '823) overlaps the composition of the instant invention, which is *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the

art at the time the invention was made to select the claimed compositions from the compositions disclosed by Oka et al. (JP '823) because Oka et al. (JP '823) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the "consisting of" transitional language in line 1 of claims 5-6 and the titanium content in Oka et al. (JP '823), the Examiner notes that Oka et al. (JP '823) discloses that titanium prevents hot working degradation due to sulfur [0020]. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to omit titanium where prevention of degradation due to sulfur would not be required or desired. MPEP 2144.04 II. Alternatively, the Examiner notes that Oka et al. (JP '823) discloses that calcium also prevents hot working degradation due to sulfur [0021]. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute calcium for titanium within the disclosed range of 0.001 to 0.01 weight percent in order to achieve equivalent prevention of degradation due to sulfur absent the titanium. MPEP 2144.06.

With respect to the hardness range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume %." in claims 5-6, the Examiner notes that Oka et al. (JP '823) discloses a substantially similar composition in addition to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point. Therefore, a hardness in the range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume % would be

expected due to a substantially similar composition and process. MPEP 2112.01 I.

With respect to the formula 0.2% ≤ Mo + Cu/4 ≤ 5% in claim 5 and 0.55% ≤ Mo + Cu/4 ≤ 5% in claim 6, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Oka et al. (JP '823) such that the formula would be satisfied because Oka et al. (JP '823) discloses the same utility throughout the disclosed ranges.

With respect to the presence of impurities in line 7 of claim 7 and line 6 of claim 8, Oka et al. (JP '823) discloses the presence of impurities (abstract).

With respect to the added recitation "and a yield strength of the steel after cooling by quenching or air cooling in a final heat treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa, wherein the final heating includes hot working in case that a reheating to a temperature of Ac_3 point or more and subsequent cooling is not conducted" in claims 5-6, Oka et al. (JP '823) teaches heating up to a temperature between Ac_1 and the Ac_3 point and then tempering at a temperature not higher than the Ac_1 point (abstract and [0007-0008]) and a yield strength that exceeds

650 MPa [0026]. Therefore, Oka et al. (JP '823) meets the claim.

In regards to claims 17-18, Oka et al. (JP '823) discloses a martensitic stainless steel having a composition relative to that of the instant invention as shown below (abstract and [0005]).

Element	Instant Claims (weight percent)	Oka et al. (JP '823) (weight percent)	Overlap
C	0.02 – 0.10	0.10 – 0.18	0.10
Si	0.05 – 1.0	0 – 0.5	0.05 – 0.5
Mn	0.05 – 0.95	0.1 – 1.5	0.1 – 0.95
P	0 – 0.03	0 – 0.02	0 – 0.02
S	0 – 0.01	0 – 0.01	0 – 0.01
Cr	9 – 15	12 – 14	12 – 14
Ni	1.0 – 4.5	1 – 3	1 – 3
Al	0 – 0.05	0 – 0.30	0 – 0.05
N	0 – 0.1	0.001 – 0.08	0.001 – 0.08
Cu	0.05 – 5	0 – 1.5	0.05 – 1.5
Mo	0.05 – 5	0 – 0.5	0.05 – 0.5
Ti	-	0.001 – 0.05	-
Ca	0.0003 – 0.005	0.001 – 0.01	0.001 – 0.005
Fe	Balance	Balance	Balance

The Examiner notes that the amounts of carbon, silicon, manganese, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper, molybdenum, and calcium of the martensitic stainless steel alloy disclosed by Oka et al. (JP '823) overlaps the composition of the instant invention, which is *prima facie* evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed compositions from the compositions disclosed by Oka et al. (JP '823) because Oka et al. (JP '823) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the hardness range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume %." in claims 17-18, the Examiner notes that Oka et al. (JP '823) discloses a substantially similar composition in addition to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point. Therefore, a hardness in the range of 30 – 45 HRC and "the amount of carbides in grain boundaries of the prior austenite is not more than 0.13 volume % would be expected due to a substantially similar composition and process. MPEP 2112.01 I.

With respect to the formula $0.2\% \leq Mo + Cu/4 \leq 5\%$ in claim 17 and $0.55\% \leq Mo + Cu/4 \leq 5\%$ in claim 18, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Saklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Oka et al. ('520) such that the formula would be satisfied because Oka et al. (JP '823) discloses the same utility throughout the disclosed ranges.

With respect to the presence of impurities in line 6 of claims 17-18, Oka et al. (JP '823) discloses the presence of presence of impurities (abstract).

With respect to the "consisting of" transitional language in line 2 of claims 17-18

and the titanium content in Oka et al. (JP '823), the Examiner notes that Oka et al. (JP '823) discloses that titanium prevents hot working degradation due to sulfur [0020]. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to omit titanium where prevention of degradation due to sulfur would not be required or desired. MPEP 2144.04 II. Alternatively, the Examiner notes that Oka et al. (JP '823) discloses that calcium also prevents hot working degradation due to sulfur [0021]. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute calcium for titanium within the disclosed range of 0.001 to 0.01 weight percent in order to achieve equivalent prevention of degradation due to sulfur absent the titanium. MPEP 2144.06.

With respect to the recitation "the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400°C or lower tempering treatment, or air cooling followed by a 400°C or lower tempering treatment" in claims 17-18 et al. (JP '823) discloses to hot rolling at the Ac_3, followed by cooling at a rate at least equal to air velocity, followed by tempering at a temperature not higher than the Ac_1 point.. Therefore, the same or a substantially similar structure would be expected.

With respect to the recitation "and the amounts of Cu and Mo effective to form a sulfide layer on a formed chromium oxide layer" in claims 17-18, the Examiner asserts that Oka et al. (JP '823) discloses amounts of copper and molybdenum effective to form this sulfide layer because Oka et al. (JP '823) discloses a substantially similar composition. MPEP 2112.01 I.

With respect to the recitation "the sulfide layer formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment" in claims 17-18, Oka et al. (JP '823) discloses a substantially similar composition. Therefore, formation of the sulfide layer would be expected when subjecting the alloy to a sulfur-containing environment. MPEP 2112.01 I.

With respect to the added recitation "and a yield strength of the steel after cooling by quenching or air cooling in a final heat treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa," in claims 17-18, Oka et al. (JP '823) teaches heating up to a temperature between Ac_1 and the Ac_3 point and then tempering at a temperature not higher than the Ac_1 point (abstract and [0007-0008]) and a yield strength that exceeds 650 MPa [0026]. Therefore, Oka et al. (JP '823) meets the claim.

Response to Arguments

Applicant's arguments filed 24 May 2011 have been fully considered but they are not persuasive.

First, the Applicant primarily argues that the yield strength value of 815 MPa in the claim limitation at issue, i.e. 815 MPa or more, is based on the yield strength value of Inventive Example No. 13 presented in Table 2 of the specification, in which the manufacturing process was finalized by water-quenching and such a position is erroneous. The Applicant further argues that Inventive Examples cannot be used

against Applicant to say that a minimum of 815 MPa is not taught in the original specification.

In response, the Examiner notes that a yield strength of 815 MPa is taught in the originally filed specification. However, the scope of "815 MPa or more", "a minimum of 815 MPa or more", and like phrases are not supported by the specification.

Second, the Applicant primarily argues that the martensitic stainless of the present invention has (1) a yield strength of the final product [yield strength A] of 815 MPa or more, and (2) a yield strength [yield strength B] of the steel after cooling by quenching or air cooling in a final treatment after final heating at a temperature of the Ac_3 point or more is not less than 815 MPa and "yield strength" does not necessarily equal "yield strength A".

In response, the Examiner notes that a steel should not have two yield strengths simultaneously and if "yield strength B" is not equal to "yield strength A", then the claim is drawn to the steel at both a final product state and an intermediate product state and therefore the scope of the claim is indefinite.

Third, the Applicant primarily argues that the missing limitations of the rejected claims cannot be assumed to be present in Oka et al. (JP '823) since the processing of Oka et al. (JP '823) is not the same and there is no basis for the Examiner to conclude that the claimed yield strength in the final product can be obtained by Oka et al. (JP '823) given that Oka et al. (JP '823) does not disclose alloys of comparable yield strength.

In response, once a reference teaching product appearing to be substantially

identical is made the basis of a rejection, and the examiner presents evidence or reasoning tending to show inherency, the burden shifts to the applicant to show an unobvious difference. "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product. Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products." *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)), see MPEP 2112. Applicant has not clearly shown an unobvious difference between the instant invention and the prior art's product. Additionally, the Examiner notes that Oka et al. (JP '823) teaches yield strengths that exceed 650 MPa, which includes the range of 815 MPa or more [0026].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938. The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jessee Roe/
Primary Examiner, Art Unit 1733